

REMARKS

This paper is responsive to the Advisory Action mailed on June 4, 2007.

No claims are canceled, no claims are added; as a result, claims 27, 33, 36-38 and 44-52 are presently pending in this application.

§103 Rejection of the Claims

The Examiner has maintained the rejection of claims 27, 33, 36-38 and 44-52 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,541,164 to Kumar *et al.* (hereinafter, “the Kumar reference”) in view of Applicant’s admitted prior art (hereinafter, “the APA”), or alternatively, as being unpatentable over the Kumar reference in view of the APA and U.S. Patent No. 4,905,073 to Chen *et al.* (hereinafter, “the Chen reference”). Applicants disagree with the stated grounds of rejection and desire to further clarify various distinctions of the present invention over the cited art. Reconsideration of the present application is therefore requested in light of the following remarks.

The Kumar reference is cited for disclosing a gate stack that includes, *inter alia*, a gate oxide layer formed on a substrate, a polysilicon layer formed on the gate oxide layer, a tungsten silicide layer formed on the polysilicon layer, and an antireflection layer formed on the tungsten silicide layer (Office Action; page 2). Although the Examiner concedes that the antireflective coating disclosed in the Kumar reference differs from the composition claimed in the present application, the Examiner nevertheless asserts that the allegedly prior art composition (“the APA”) provided in the present application is necessarily compatible with the structure disclosed in the Kumar reference. Applicants yet again disagree.

Applicants previously noted that the composition disclosed by Kumar differs markedly from the antireflective coating composition disclosed in the present application. As earlier described, the composition disclosed in the present application includes a silicon component that varies between 0.39 and 0.65, while Kumar teaches a silicon component that is equal to one. Similarly, the oxygen component taught by the Kumar

reference ranges between one and two, while the present application teaches an oxygen component that ranges between 0.05 and 0.33.

In the Advisory Action, the Examiner submits that, although the antireflective coating disclosed in the Kumar reference differs from the presently disclosed composition, that the presently disclosed composition may nevertheless be obtained through “routine optimization” of the composition disclosed in Kumar. Applicants simply disagree with the Examiner.

A prior art reference that discloses a range that encompasses a somewhat narrower claimed range may be generally regarded as sufficient to establish a *prima facie* case of obviousness. *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir 2003). When the prior art reference discloses a range that lies outside the disclosed ranges, a *prima facie* case of obviousness may still exist where the claimed ranges and the prior art ranges are not overlapping, *but are close enough that one skilled in the art would expect them to have the same properties*. *Titanium Metals Corp of America v. Banner*, 778 F.2d 775, 27USPQ 773 (Fed. Cir 1985). Applicants submit that neither of the foregoing reasonably applies here. For example, the Kumar reference teaches a silicon component equal to one, while the presently disclosed silicon component varies between 0.39 and 0.65. Applicants note that the ranges are not overlapping, nor are they sufficiently close to allow one skilled in the art to reasonably arrive at the presently disclosed composition. With respect to the oxygen content, Applicants also similarly note that no overlap presently exists, and the disclosed range differs substantially from that disclosed in the Kumar reference. Accordingly, Applicants maintain that it is simply unreasonable to expect one skilled in the art to obtain the presently recited composition when the “routine optimization” would require undue experimentation that lies clearly beyond the ranges cited in Kumar. The Examiner’s position cannot be reasonably maintained since it is not obvious that the structure in Kumar, when combined with the APA will have the requisite reasonable

expectation of success. Applicants therefore respectfully request that the rejections based upon the Kumar in combination with the APA be removed.

The Applicants again note that the Examiner concedes that the Kumar reference fails to disclose that the metal silicide layer is an annealed metal silicide layer, and cites the Chen reference for this missing disclosure. Chen discloses an annealing step for a silicide layer in an integrated circuit structure. In particular, the Examiner points to the disclosure at column 3, lines 49-51 that describes annealing a silicide that abuts a polysilicon layer (*e.g.*, layers 109 and 118 in Figure 2), and abutting glass, conductive and doped silicon layers (*e.g.*, elements 123, 128, 105 and 103, respectively, also as shown in Figure 2). Applicants cannot find any teaching or suggestion in the Chen reference that the annealing process may be conducted *following the application of an antireflection coating* to the silicide layer. Applicants therefore respectfully request that the rejections under 35 U.S.C. § 103(a) be removed. If the Examiner can point to a pertinent teaching in the Chen reference that discloses this, he is invited to specifically point out where this necessary teaching may be found.

Applicants also note that, in the various disclosed embodiments of the present invention, the disclosed antireflective layer may be interposed between a silicon nitride layer and underlying polysilicon and metal silicide layers. Accordingly, the disclosed antireflective layer may be suitably configured, in terms of composition and/or thickness, to absorb stresses imposed by the relatively thick nitride layer. For example, claim 50 presently recites, in pertinent part: “A gate stack, comprising...a gate oxide layer over a semiconductive substrate...a polysilicon layer on the gate oxide layer...an annealed, titanium silicide layer on the polysilicon layer...[and]...*a means for alleviating stress on underlying layers, canceling reflected radiation, and protecting the annealed, titanium silicide layer during an anneal from gaseous oxygen, the means comprising a $Si_xN_yO_z:H$ layer formed over and in physical contact with the annealed, titanium silicide layer...*” (Emphasis added). The Applicant has been unable to find any relevant teaching or suggestion in the Kumar reference that the antireflective layer may be suitably configured to provide this. The Chen reference fails to provide this missing teaching. Accordingly, claim 50 is also presently allowable. Claims depending from claim 50 are also allowable

based upon the allowable form of the base claim, and further in view of the additional limitations recited in the dependent claims.

Reservation of Rights

In the interest of clarity and brevity, Applicant may not have addressed every assertion made in the Office Action. Applicant's silence regarding any such assertion does not constitute any admission or acquiescence. Applicant reserves all rights not exercised in connection with this response, such as the right to challenge or rebut any tacit or explicit characterization of any reference or of any of the present claims, the right to challenge or rebut any asserted factual or legal basis of any of the rejections, the right to swear behind any cited reference such as provided under 37 C.F.R. § 1.131 or otherwise, or the right to assert co-ownership of any cited reference. Applicant does not admit that any of the cited references or any other references of record are relevant to the present claims, or that they constitute prior art. To the extent that any rejection or assertion is based upon the Examiner's personal knowledge, rather than any objective evidence of record as manifested by a cited prior art reference, Applicant timely objects to such reliance on Official Notice, and reserves all rights to request that the Examiner provide a reference or affidavit in support of such assertion, as required by MPEP § 2144.03. Applicant reserves all rights to pursue any cancelled claims in a subsequent patent application claiming the benefit of priority of the present patent application, and to request rejoinder of any withdrawn claim, as required by MPEP § 821.04.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (612) 349-9587 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

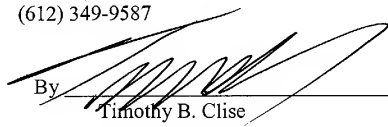
Respectfully submitted,

ZHIPING YIN ET AL.

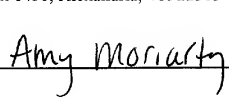
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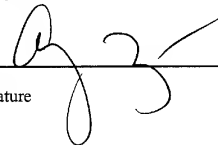
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Date 16 July '07

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 16th day of July 2007.


Name


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